SECTION 283113

FIRE ALARM PANELS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Provide combination intrusion detection and fire alarm control panels, including engineering, components, installation and commissioning.

1.2 RELATED SECTIONS

A. Section 260500: Common Work Results for Electrical, for interface and coordination with building electrical systems and distribution.

1.3 REFERENCES

A. Reference Standards: Provide systems which meet or exceed the requirements of the following publications and organizations as applicable to the Work of this Section:

1. Underwriters Laboratories Inc. (UL):

a. UL 268: Smoke Detectors for Fire Protective Signaling Systems.

b. UL 365: Police Station Connected Burglar Alarm Units and Systems.

c. UL 609: Local Burglar Alarm Units and Systems.

d. UL 611: Central Station Burglar-Alarm Units.

e. UL 636: Holdup Alarm Units and Systems.

f. UL 684: Local, Central Station, and Remote Station.

g. UL 864: Control Units for Fire Protective Signaling Systems.

h. UL 985: Household Fire Warning System Units.

i. UL 1023: Household Burglar-Alarm System Units.

j. UL 1076: Proprietary Burglar-Alarm Units and Systems.

k. UL 1610: Central-Station Burglar-Alarm Units.

2. Federal Communications Commission (FCC):

a. Code of Federal Regulations Title 47: Part 15: Radio Frequency Devices.

b. Code of Federal Regulations Title 47: Part 68: Connection of Terminal Equipment to the Telephone Network.

3. National Fire Protection Association (NFPA:

a. NFPA 70: National Electrical Code

b. NFPA 72: National Fire Protection Code.

1.4 SYSTEM DESCRIPTION

A. Combination Intrusion Detection and Fire Alarm Control Panels: Basis-of-design is the Honeywell VISTA-128FBPT System, a burglary/access control/CCTV switching system that includes the following capabilities:

1. Listed for UL Commercial Fire and Burglary.
2. Dual processor supports up to 128 zones.
3. Supports up to 8 separate partitions.
4. Supports up to 128 users.
5. Supports commercial wireless devices.
6. Provides integrated security, access control, and CCTV switching capability.
7. Provides supervision of peripheral devices.
8. Supports up to 96 optional relay outputs.
9. Supports long-range radio (LRR) communication.
10. Provides scheduling capability to allow for automated operations.
11. Supports alarm reporting via Internet.
12. Interfaces with automation software.
13. Monitors smoke detector maintenance signals

1.5 SUBMITTALS

A. Manufacturer’s Product Data: Submit manufacturer’s data sheets indicating systems and components proposed for use, including instruction manuals.

B. Shop Drawings: Submit complete shop drawings including connection diagrams for interfacing equipment, list of connected equipment, and locations for major equipment components.

C. Record Drawings: During construction maintain record drawings indicating location of equipment and wiring. Submit an electronic version of record drawings not later than Substantial Completion of the project.

D. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, customized to the system installed. Include system and operator manuals.

E. Field Tests: Submit results of field testing of every device including date, testing personnel, retesting date if applicable, and confirmation that every device passed field testing.

F. Maintenance Service Agreement: Submit a sample copy of the manufacturer's maintenance service agreement, including cost and services for a one year period for Owner's review. Maintenance shall include, but not be limited to, labor and materials to repair the system, provide test and adjustments, and regular inspections.

1.6 QUALITY ASSURANCE

A. Manufacturer: Minimum ten years experience in manufacturing and maintaining similar systems. Manufacturer shall provide toll-free technical assistance and support available 24/7. Alarm manufacturer shall be certified compliant with ISO 9001.

B. Installer: Minimum two years experience installing similar systems, and acceptable to the manufacturer.

C. Environmental Conditions: System shall be designed to function in the following environmental conditions:

1. Storage Temperature: Designed for a storage temperature of -10° C to 70°C.
2. Operating Temperature: System shall be designed for an operating temperature of 0° C to 50°C (32° F to 120°F).
3. Humidity: System shall be designed for normal operation in an 85% relative humidity environment.
4. Electromagnetic Interference: System shall meet or exceed the requirements of FCC Part 15, Class B devices, FCC Part 68, IEC EMC directive.

D. Power Requirements: Components shall have the following electrical specifications. The system shall operate using standard 120 VAC, 50 Hz/60 Hz power.

1. Control Primary Power: Transformer power shall be 18 VAC, 72 VA.
2. Backup Battery: Rechargeable 12 VDC, gel type, lead acid backup battery shall be provided. The battery shall be rated between 12 and 34-ampere hours (AH).
3. Alarm Power: 12 VDC, 1.7 amps for each bell output
4. Auxiliary Standby Power: 12 VDC, 1 amp maximum.
5. Total Power: Combined auxiliary standby and alarm currents shall be 2.3 amps.
6. Fusing: The battery input, auxiliary, and bell outputs shall be protected using PTC circuit breakers. All outputs shall be power limited.

E. Control Panel Enclosure: A metal cabinet, suitable for wall mounting. Dimensions shall not exceed 18 inches (45.72 cm) in height, 14.5 inches (36.83 cm) in width or 3 inches (10.92 cm) in depth.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's labeled packages. Store and handle in accordance with manufacturer's requirements, in a facility with environmental conditions within recommended limits.

1.8 WARRANTY

A. Manufacturer's Warranty: Submit manufacturer's standard one-year warranty for the system.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Intrusion Detection and Fire Alarm Panel Manufacturer: VISTA-128FBPT by Honeywell, www.security.honeywell.com.

2.2 SYSTEM PERFORMANCE

A. Control Panel: The control panel shall be an 8-partition, UL commercial fire and burglary control panel that supports up to 128 zones using basic hardwired, polling loop, and wireless zones. It shall also provide supervision of 2 notification appliance output circuits (NAC), RF receivers, and relay modules. The control shall provide the ability to schedule time-driven events, and allow certain operations to be automated by pressing a single button. The system shall be capable of interfacing with an ECP GSM communicator that can send Contact ID messages. The control shall provide integrated access control capability with the use of a single downloader and database.

1. Basic Hardwired Zones: Control shall provide 8 style-B hardwire zones with the following characteristics:

    a. EOLR supervision (optional for zones 2-8) shall support N.O. or N.C. sensors (EOLR supervision required for UL installations).

    b. Zones/Points shall be individually assignable to any partition.

    c. Supports up to 32 two-wire smoke detectors on two selected zones.

    d. Supports four-wire smoke or heat detectors on any zone (power to four-wire smoke detectors must be supervised with an EOL device).

    e. Individually assignable to Notification Appliance (NAC) outputs and/or auxiliary relays.

2. Optional Expansion Zones:

    a. Polling Loop Expansion: Control shall support up to 120 additional hardwire zones using a built-in two-wire polling (multiplex) loop interface. The polling loop shall provide power and data to remote point modules, and constantly monitor the status of all zones on the loop. Maximum current draw shall not exceed 128mA. The polling loop zones shall have the following characteristics:

        1) Interface with RPM (Remote Point Module) devices that provide Class B, Style Y (e.g., 4208U/4208SN) or a combination of Class B, Style Y, and Class A, Style Z (e.g., 4208SNF) zones.

        2) Individually assignable to one of 8 partitions.

        3) Supervised by the control panel.

        4) A 12,000 ft (3658 m) wire run capability without using shielded cable.

        5) Each RPM (Remote Point Module) enclosure shall be tamper protected.

    b. Wireless Expansion Zone: Control shall support up to 127 wireless zones using a 5800ENHC RF receiver (fewer if using hardwire and/or polling loop zones). Wireless zones shall have the following characteristics:

        1) Supervised by control panel for check-in signals (except certain non-supervised transmitters).

        2) Tamper-protection for supervised zones.

3) Individually assignable to one of 8 partitions.

4) Individually assignable to bell outputs and/or auxiliary relays.

5) Support wireless devices listed for Commercial Burglary using the 5881ENHC RF Receiver.

3. Partitions: Control shall provide the ability to operate e8 separate areas, each functioning as if it had its own control. Partitioning features shall include:

a. A Common Lobby partition (1-8), which can be programmed to perform the following functions:

1) Arm automatically when the last partition that shares the common lobby is armed.

2) Disarm when the first partition that shares the common lobby is disarmed.

b. A Master partition (9), used strictly to assign keypads for the purpose of viewing the status of all 8 partitions at the same time (master keypads).

c. Assignable by zone.

d. Assignable by keypad/annunciator.

e. Assignable by relay to one or all 8 partitions.

f. Ability to display fire and/or burglary and panic and/or trouble conditions at all other partitions' keypads (selectable option).

g. Certain system options selectable by partition, such as entry/exit delay and subscriber account number.

4. User Codes: Control shall accommodate 150 user codes, all of which can operate any or all partitions. Certain characteristics must be assigned to each user code, as follows:

a. Authority level (Master, Manager, or several other Operator levels). Each User Code (other than the installer code) shall be capable of being assigned the same or a different level of authority for each partition that it will operate.

b. Opening/Closing central station reporting option.

c. Specific partitions that the code can operate.

d. Global arming capability (ability to arm all partitions the code has access to in one command).

e. Use of an RF (button) to arm and disarm the system (RF key must first be enrolled into the system).

5. Peripheral Devices: Control shall support up to 30 addressable ECP devices, which can be any combination of keypads, RF receivers, relay modules, and interactive phone modules. Peripheral devices have the following characteristics:

a. Each device set to an individual address according to the device's instructions.

b. Each device enabled in system programming.

c. Each device's address shall be supervisable (via a programming option).

6. Keypad/Annunciator: Control shall accommodate up to 30 keypads or six (6) touch-screen (i.e.; advanced user interface) keypads. The keypads shall be capable of the following

a. Performing all system arming functions.

b. Being assigned to any partition.

c. Providing four programmable single-button function keys, which can be used for:

1) Panic Functions: activated by wired and wireless keypads; reported separately by partition.

2) Keypad Macros: 32 keypad macro commands per system (each macro is a series of keypad commands). Assignable to the A, B, C, and D keys by partition.

7. Optional Output Relays: A total of 96 relay outputs shall be accommodated using relay modules. Each relay module shall provide four (4) Form C (normally open and normally closed) relays for general-purpose use or two (2) Class-B, Style-Y supervised notification appliance circuit outputs, when using the 4204CF module. The relays shall be capable of being:

a. Programmed to activate in response to system events.

b. Programmed to activate using time intervals.

c. Activated manually.

d. Assigned an alpha descriptor.

e. Used for Class B, Style-Y supervised bell outputs (4204CF module).

f. A combination of 4204 (ECP) and 4101SN (polling loop) relays.

8. Optional Vista Interactive Phone Module: The control shall support the ADEMCO 4286 VIP Modules, which permit access to the security system in order to perform the following functions:

a. Obtain system status information.

b. Arm and disarm the security system.

c. Control relays.

9. Notification Appliance Circuits (NAC): Control panel shall internally provide two supervised NAC outputs for operating fire and burglar alarm notification appliances. It shall also support additional supervised bell outputs when using 4204CF relay modules. Each NAC output shall be rated at 10-14 VDC, 1.7 amp max power limited. Total alarm current draw when using two NAC outputs shall not exceed 2.3 amps for battery independent operation.

10. Auxiliary Relay: A built-in Form C relay shall be provided. The relay contacts shall be rated at 28 VAC/VDC, 2.8 amps maximum. The relay shall support:

a. Alarm activation.

b. Trouble/supervisory activation.

c. Reset of four-wire smoke detectors.

d. Battery saving feature.

11. Integrated Access Control: Control shall be capable of the following:

a. Providing a command that activates relays to allow access doors to open (e.g., lobby door), lights to be turned on or off, etc.

b. Becoming a fully integrated access control system by using numerous VistaKey Single-Door Access Control Modules.

c. Supporting up to 8 VistaKey Access Control Modules. The VistaKey Access Control Modules shall use the same Compass Downloader as the Vista-128FBPT and shall be programmable from the Compass Downloader or the Keypad/Annunciators.

d. Assigning any number of access control relays to each partition (up to 8 for the system).

e. Supporting up to 250 access card holders using VistaKey.

12. Commercial Wireless Equipment: Control shall be compatible with UL Listed Commercial Wireless Fire & Security equipment including:

a. ADEMCO 5881ENHC Commercial Fire/Burg Receiver.: The receiver shall be capable of receiving as many points as the control panel is rated for. Up to two (2) Receivers may be used on any system. Receivers may be remotely located anywhere on the system ECP bus.

b. ADEMCO 5808W3 Wireless Photoelectric Smoke and Heat Detector: The device shall be UL 268 listed and shall have Maintenance Alert capability and Automatic Drift Compensation.

c. ADEMCO 5809 Wireless 135D Fixed Temperature and Rate of Rise Heat Detector: The device shall be UL 521 listed for commercial applications.

d. ADEMCO 5817CB Wireless Universal Contact Monitoring Transmitter: This device shall be capable of making any conventional UL listed contact device a wireless device. The device shall be UL listed for commercial fire and burglary applications as follows: UL 864, 985 for fire and UL 365, 609, 1023, 1076 and 1610 for security and nurse call.

e. ADEMCO 5869 Wireless Hold Up Switch/Transmitter: This device shall be UL 636 listed for commercial burglary applications.

13. Optional Keyswitch: Control shall support the ADEMCO 4146 Keyswitch on any one of the system's 8 partitions. If used, zone 7 is no longer available as a protection zone.

14. Voltage Triggers: System shall provide voltage triggers, which change state for different conditions. Used with GSM Cellular equipment or other devices such as a remote keypad sounder or keyswitch ARMED and READY LEDs.

15. Event Log: System shall maintain a log of different event types (enabled in programming). The event log shall provide the following characteristics:

a. Stories up to 512 events.

b. Viewable at the keypad or through the use of Compass software.

c. Printable on a serial printer using the onboard serial port, including zone alpha descriptors.

16. Scheduling: Provides the following scheduling capabilities:

    a. Open/close schedules (for control of arming/disarming and reporting).

    b. Holiday schedules (allows different time windows for open/close schedules).

    c. Timed events (for activation of relays, auto-bypassing and un-bypassing, auto-arming and disarming, etc.).

    d. Access schedules (for limiting system access to users by time).

    e. End User Output Programming Mode (provides 20 timers for relay control).

    f. The system shall automatically adjust for daylight savings time.

17. Communication Features: Supports the following formats and features for the primary and secondary central station receivers:

    a. Formats: ADEMCO Express; ADEMCO Contact ID.

    b. Backup reporting: The system shall support backup reporting via the following: Secondary phone number; ECP long-range radio (LRR) interface; option to select long range radio (LRR) or dialup as the primary reporting method (dynamic signaling feature).

    c. Internet reporting: The system shall be capable of communicating with the central station via the internet using Alarmnet-i. It shall provide the user with the ability to control the system via a browser interface (i.e., AOL, Netscape, Internet Explorer). All packet data transmitted to the monitoring station shall be encrypted with a minimum of 256 bits of encryption.

18. Audio Alarm Verification Option: Provides a programmable Audio Alarm Verification (AAV) option that can be used in conjunction with an output relay to permit voice dialog between an operator at the central station and a person at the premises.

19. Cross-Zoning Capability: Helps prevent false alarms by preventing a zone from going into alarm unless its cross-zone is also faulted within 5 minutes.

20. Exit Error False Alarm Prevention Feature: System shall be capable of differentiating between an actual alarm and an alarm caused by leaving an entry/exit door open. If not subsequently disarmed, the control panel shall:

    a. Bypass the faulted E/E zone(s) and/or interior zones and arm the system.

b. Generate an Exit Error report by user and by zone so the central station knows it was an exit alarm and who caused it.

21. Enhanced Fire Walk-Test Mode: Control Panel shall provide the installer with the following features:

    a. Automatic test of all integrated remote point module (RPM) devices, equipped with an automatic test feature.

    b. While automatic test is in progress all fire zones that remain untested shall be displayed.

    c. An event log shall be capable of logging the results of tested and untested zones.

    d. The ability to report the result of tested and untested zones to the central station.

22. Built-in User's Manual and Descriptor Review: For end-user convenience, the control panel shall contain a built-in User’s Manual. It shall include the following capabilities:

    a. By depressing any of the function keys on the keypad for five (5) seconds, a brief explanation of that function shall scroll across the alphanumeric display.

    b. By depressing the READY key for five (5) seconds, all programmed zone descriptors shall be displayed (one at a time). This feature shall provide a check for installers and ensure all descriptors have been entered properly.

23. Programming: Control shall be capable of being programmed locally or remotely using the Honeywell Compass Downloader and shall be capable of:

    a. Uploading and downloading all programming information at 300 baud.

    b. Uploading and displaying firmware revision levels from the control.

24. Automation Software: The Control shall be capable of interfacing with automation software via an RS232 input on any partition.

2.3 COMPONENTS

A. System Integration: System shall integrate with facility doors, windows, and departments. The system shall also integrate with external systems, such as building appliances and building alert systems for remote control and central collection of external system alerts. When integrated with external systems, the system shall connect to the external system to receive status changes by way of a dry contact output from the external system. The system shall use its user interface to provide local status messages from external systems, providing for the initiation of local building policies. Optionally, the system may transmit information to an off-site monitoring service to provide initiation of remote policies when appropriate. The installer shall follow manufacture's instructions when installing and programming system equipment.

1. V-Plex Bus Extensions: Extended system V-Plex bus branch circuits shall be scaleable to increase the total size of the bus in larger installations. Branch circuits leading from different buildings or from different floors in multi-story buildings shall be isolated from one another so that a shorted or grounded branch circuit is isolated away from other near-side branch circuits, allowing other V-Plex devices to be isolated so that they can continue to operate.

2. Zone Input: System zone inputs allow the system to sense the change in state of an output from an external device, such as a door/window position sensor, a motion detector, a relay output from an appliance, the output of an external alert system, or other devices that provide a dry closure output.

3. Fire Alarm Heat Detectors: Selected areas in the facility will use Heat detectors to sense rapid increases of heat caused by spot fires. The quantity and spacing of detectors shall meet those suggested by UL, NFPA and other recognized agencies. Locations for Spot fire heat detectors may be in kitchens, laboratories, server rooms, classrooms or other areas where required. For each Heat detector, install a Honeywell 4193SNP zone input module and a listed Spot fire heat detector.

4. Fire System Smoke Detectors: Selected areas in the facility will use Smoke detectors to sense the buildup of Smoke caused by fires and smoldering objects. The quantity and spacing of detectors shall meet those suggested by UL, NFPA and other recognized agencies and building codes. Locations for Smoke detectors may be in hallways, laboratories, server rooms, classrooms or other areas where required. Where designated in plans for each Smoke detector, install a Honeywell 5193SDT or 5193D Smoke detector or equivalent.

5. Fire Suppression System Activation: Monitor the status of the Fire Suppression system, and shall initiate a Fire alarm when water in the suppression system flows for a specified amount of time. The water flow sensor shall connect to a 4193SNP or equivalent.

6. Post Indicator Valves: Monitor tamper switches inside of Post Indicator or other designated Fire Suppression System control valves. The Post Indicator valve shall connect to a zone input module or a zone input on the FACP.

7. Automatic Duct Damper Control: Selected HVAC ducts in the facility will use system automatic duct control capabilities to close duct dampers in the event of particular system events, such as in the case of a fire alarm. For each automatic duct damper, install a 4101SN relay output module.

8. Elevator Recall: Selected elevators in the facility will use system automatic recall control capabilities to return the elevator to a selected floor in the event of particular system events, such as in the case of a fire alarm. For each elevator, install a 4204 or 4101SN relay output module.

9. Automatic Door Holders: Selected doors in the facility will use system automatic door holder capabilities to hold doors open until particular system events release the door. For each automatic locking door, install a 4101SN relay output module, a power supply, and an electric magnetic door holder device.

10. Manual Pull Stations: Include manual fire alarm stations near exits, stairwells, and other locations recommended by UL, NFPA, and local building codes. The manual pull station shall be the Honeywell Model 5140MPS-1 and a 4193SNP or equivalent.

11. Knox Box Tampers: Monitor tamper switches inside of Knox Boxes or other Fire Department key cabinets. The key cabinet shall be a Knox Box and a 4193SNP or equivalent.

12. Hood Fire Suppression: Include a connection to each stove hood suppression alarm to supervise its charge and discharge statuses as required by UL, NFPA, and local building codes. The hood suppression system alarm and trouble outputs shall be connected to a 4193SNP zone input module or equivalent.

13. Fire System Beam Type Smoke Detectors: Selected areas in the facility will use Beam Smoke detectors to sense the buildup of Smoke caused by fires and smoldering objects. The quantity and spacing of detectors shall meet those suggested by UL, NFPA and other recognized agencies and building codes. Locations for Smoke detectors may be in hallways, laboratories, server rooms, meeting rooms or other areas where required. For each Smoke detector, install a Honeywell BK-Beam1224 Smoke detector.

14. Fire Alarm Initiating Devices: Include a connection to each initiating device to supervise its idle, trouble, and alarm statuses as required by UL, NFPA, and local

building codes. The fire initiating device alarm and trouble outputs shall be connected to a 4193SNP zone input module or equivalent.

15. Fire System Duct Smoke Detectors: Selected areas in the facility will use Duct Smoke detectors to sense smoke in HVAC supply and return air ducts. The quantity and spacing of detectors shall meet those suggested by UL, NFPA and other recognized agencies and building codes. Locations for Duct Smoke detectors may be in hallways, laboratories, server rooms, classrooms or other areas where required. For each Duct Smoke detector, install a Honeywell zone input module and a listed Duct Smoke detector.

16. Wireless Smoke Detectors: Include wireless smoke detectors in designated locations. The when the wireless smoke detector is triggered into alarm, it shall send alarm messages at four second intervals until the wireless smoke detector restores to its idle condition. Each wireless smoke detector shall send periodic check-in signals to its associated control panel. The smoke detector's associated control panel shall report any missing smoke detector within four and one-half hours. Each smoke detector shall report any low battery condition a minimum of seven days before its battery becomes too discharged to power the smoke detector. The smoke detector's associated control panel shall report any low battery condition by providing a local indication at system keypads, and shall send a trouble report to the central monitoring station. The wireless smoke detector shall include a head tamper switch and a rear tamper switch so that it shall send a tamper alarm in the event that the smoke detector's head is removed, or if the smoke detector is removed from its mounting surface. The model number of the wireless smoke detector shall be Honeywell 5808W3 or equivalent.

17. Wireless Heat Detectors: Include wireless heat detectors in designated locations. The when the heat detector is triggered into alarm, the heat detector shall send alarm messages at four second intervals until the heat detector is restored to its normal condition. Each wireless heat detector shall send periodic check-in signals to its associated control panel. The heat detector's associated control panel shall report any missing heat detector within four and one-half hours. Each heat detector shall report any low battery condition a minimum of seven days before its battery becomes too discharged to power the heat detector. The heat detector's associated control panel shall report any low battery condition by providing a local indication at system keypads, and shall send a trouble report to the central monitoring station. The wireless heat detector shall include a head tamper switch so that it shall send a tamper alarm in the event that the heat detector's head is removed. The model number of the wireless heat detector shall be Honeywell 5809 or equivalent.

18. Wireless Manual Fire Pull Station: Include Wireless Manual Fire Pull Stations and wireless transmitters at designated locations. The when the manual pull station is triggered into alarm, the wireless transmitter shall send alarm messages at four second intervals until the wireless manual pull station is restored to its normal position. Each wireless transmitter shall send periodic check-in signals to its associated control panel. The transmitter's associated control panel shall report any missing transmitter within four and one-half hours. Each transmitter shall report any low battery condition a minimum of seven days before its battery becomes too discharged to power the transmitter. The transmitter's associated control panel shall report any low battery condition by providing a local indication at system keypads, and shall send a trouble report to the central monitoring station. The wireless transmitter shall include a cover tamper switch and a rear tamper switch so that it shall send a tamper alarm in the event that the transmitter's cover is removed, or if the transmitter is removed from its mounting surface. The model number of the wireless Manual Fire Pull Stations shall be Honeywell 5140MPS-1 and the 5817CB or equivalent.

19. Wireless Fire Suppression Waterflow Detection: Include Wireless Fire Suppression Waterflow Detection at each fire suppression sprinkler riser pipe. The when the waterflow detector is triggered into alarm, the wireless transmitter shall send alarm messages at four second intervals until the wireless waterflow detector is restored to its normal position. Each wireless transmitter shall send periodic check-in signals to its associated control panel. The transmitter's associated control panel shall report any missing transmitter within four and one-half hours. Each transmitter shall report any low battery condition a minimum of seven days before its battery becomes too discharged to power the transmitter. The transmitter's associated control panel shall report any low battery condition by providing a local indication at system keypads, and shall send a trouble report to the central monitoring station. The wireless transmitter shall include a cover tamper switch and a rear tamper switch so that it shall send a tamper alarm in the event that the transmitter's cover is removed, or if the transmitter is removed from its mounting surface. The model number of the wireless transmitter is the 5817CB or equivalent.

20. Wireless Post Indicator Valve Tamper: Include Wireless Post Indicator Valve Tamper Detection at each fire suppression sprinkler system Post Indicator Valve. The when the Post Indicator Valve Tamper is triggered into alarm, the wireless transmitter shall send supervisory messages at four second intervals until the Post Indicator Valve Tamper Switch is restored to its normal position. Each wireless transmitter shall send periodic check-in signals to its associated control panel. The transmitter's associated control panel shall report any missing transmitter within four and one-half hours. Each transmitter shall report any low battery condition a minimum of

seven days before its battery becomes too discharged to power the transmitter. The transmitter's associated control panel shall report any low battery condition by providing a local indication at system keypads, and shall send a trouble report to the central monitoring station. The wireless transmitter shall include a cover tamper switch and a rear tamper switch so that it shall send a tamper alarm in the event that the transmitter's cover is removed, or if the transmitter is removed from its mounting surface. The model number of the wireless transmitter is the 5817CB or equivalent.

21. Wireless Knox Box Tamper Supervision: Include Wireless Knox Box Tamper Supervision at each Knox Box Fire Department key safe. The when the Knox Box Tamper is triggered into alarm, the wireless transmitter shall send supervisory messages at four second intervals until the Knox Box Tamper Switch is restored to its normal position. Each wireless transmitter shall send periodic check-in signals to its associated control panel. The transmitter's associated control panel shall report any missing transmitter within four and one-half hours. Each transmitter shall report any low battery condition a minimum of seven days before its battery becomes too discharged to power the transmitter. The transmitter's associated control panel shall report any low battery condition by providing a local indication at system keypads, and shall send a trouble report to the central monitoring station. The wireless transmitter shall include a cover tamper switch and a rear tamper switch so that it shall send a tamper alarm in the event that the transmitter's cover is removed, or if the transmitter is removed from its mounting surface. The model number of the wireless transmitter is the 5817CB or equivalent.

22. Wireless Duct Smoke Detectors: Include Wireless Duct Smoke Detectors Alarms at each Duct Smoke Detector. The when the Duct Smoke Detector is triggered into alarm, the wireless transmitter shall send supervisory messages at four second intervals until the Duct Smoke Detector is restored to its normal position. Each wireless transmitter shall send periodic check-in signals to its associated control panel. The transmitter's associated control panel shall report any missing transmitter within four and one-half hours. Each transmitter shall report any low battery condition a minimum of seven days before its battery becomes too discharged to power the transmitter. The transmitter's associated control panel shall report any low battery condition by providing a local indication at system keypads, and shall send a trouble report to the central monitoring station. The wireless transmitter shall include a cover tamper switch and a rear tamper switch so that it shall send a tamper alarm in the event that the transmitter's cover is removed, or if the transmitter is removed from its mounting surface. The model number of the wireless transmitter is the 5817CB or equivalent.

23. Wireless Fire Suppression System Activation Detection: Include Wireless Fire Suppression System Activation Detection Alarms at each Fire Suppression System. The when the Fire Suppression System is triggered into alarm, the wireless transmitter shall send supervisory messages at four second intervals until the Fire Suppression System is restored to its idle state. Each wireless transmitter shall send periodic check-in signals to its associated control panel. The transmitter's associated control panel shall report any missing transmitter within four and one-half hours. Each transmitter shall report any low battery condition a minimum of seven days before its battery becomes too discharged to power the transmitter. The transmitter's associated control panel shall report any low battery condition by providing a local indication at system keypads, and shall send a trouble report to the central monitoring station. The wireless transmitter shall include a cover tamper switch and a rear tamper switch so that it shall send a tamper alarm in the event that the transmitter's cover is removed, or if the transmitter is removed from its mounting surface. The model number of the wireless transmitter is the 5817CB or equivalent.

24. Wireless Receivers for Commercial Applications: Include Commercial Wireless Receivers where designated. The wireless receiver shall be UL Listed, Factory Mutual Approved, MEA Listed, and CSFM Listed for the application. The wireless receiver shall receive messages from wireless devices indicating device detection loop open, normal, shorted, tamper alarm, and low battery status when sent from transmitters associated with the system. Each wireless transmitter shall send periodic check-in signals to its associated control panel. The transmitter's associated control panel shall report any missing transmitter within four and one-half hours. Each transmitter shall report any low battery condition a minimum of seven days before its battery becomes too discharged to power the transmitter. The transmitter's associated control panel shall report any low battery condition by providing a local indication at system keypads, and shall send a trouble report to the central monitoring station. The model number of the receiver is Honeywell 5881ENHC or equivalent.

25. Wireless Repeaters for Commercial Applications: Include Commercial Wireless Repeaters where designated. The wireless repeater shall be UL Listed for the application. The wireless repeater shall receive and forward messages from wireless devices indicating device detection loop open, normal, shorted, tamper alarm, and low battery status when sent from transmitters associated with the system. Each wireless transmitter shall send periodic check-in signals to its associated control panel. The transmitter's associated control panel shall report any missing transmitter within four and one-half hours. Each transmitter shall report any low battery condition a minimum of seven days before its battery becomes too discharged to power the transmitter. The transmitter's associated control panel

shall report any low battery condition by providing a local indication at system keypads, and shall send a trouble report to the central monitoring station. The model number of the repeater is Honeywell 5800RP or equivalent.

26. Interior Fire Horns: In the event of a fire alarm on the system, the control panel shall sound a System Sensor model BK-HR 12/24VDC Fire Horn or equivalent, that features a sound level of 67-77dB at 20 feet. The horn shall feature a polarized power input If the siren is removed from the NAC circuit, the system shall send a supervisory report to the monitoring station. The Fire Horn shall be UL Listed, FM approved, CSFM listed and MEA listed for the application. The installer shall install the fire horn as directed by the manufacturer's installation instructions.

27. Wall Mounted, Multi-Candela Strobes Notification Appliances: In the event of a fire alarm on the system, the control panel shall activate a System Sensor model BK-SR Fire Strobe or equivalent, that features a candela setting specified between 15cd and 115cd. The strobe shall feature a polarized power input. If the strobe is removed from the NAC circuit, the system shall send a supervisory report to the monitoring station. The Fire strobe shall be UL Listed, FM approved, CSFM listed and MEA listed for the application. The installer shall install the fire strobe as directed by the manufacturer's installation instructions.

28. Wall Mounted, 4-Wire, Interior Fire Horn/Strobes: In the event of a fire alarm on the system, the control panel shall sound a System Sensor model P4R Fire Horn/Strobe or equivalent, that features a selectable light level between 15cd and 115cd. The Horn/Strobe shall feature a polarized power input. If the Horn/Strobe is removed from the NAC circuit, the system shall send a supervisory report to the monitoring station. The Fire Horn/Strobe shall be UL Listed, FM approved, CSFM listed and MEA listed for the application. The installer shall install the fire Horn/Strobe as directed by the manufacturer's installation instructions.

29. Wall Mounted, 2-Wire, Interior Fire Horn/Strobes: In the event of a fire alarm on the system, the control panel shall sound a System Sensor model BK-P2R 12/24VDC Fire Horn/Strobe or equivalent, that features a selectable light level between 15cd and 115cd. The Horn/Strobe shall feature a polarized power input. If the Horn/Strobe is removed from the NAC circuit, the system shall send a supervisory report to the monitoring station. The Fire Horn/Strobe shall be UL Listed, FM approved, CSFM listed and MEA listed for the application. The installer shall install the fire Horn/Strobe as directed by the manufacturer's installation instructions.

30. Ceiling Mounted, Multi-Candela Strobe Notification Appliances: In the event of a fire alarm on the system, the control panel shall activate a System Sensor model BK-SCR Fire Strobe or equivalent, that features a candela setting specified between 15cd and

115cd. The strobe shall feature a polarized power input. If the strobe is removed from the NAC circuit, the system shall send a supervisory report to the monitoring station. The Fire strobe shall be UL Listed, FM approved, CSFM listed and MEA listed for the application. The installer shall install the fire strobe as directed by the manufacturer's installation instructions.

31. Ceiling Mounted, Indoor 4-Wire, Fire Horn/Strobes: In the event of a fire alarm on the system, the control panel shall sound an outdoor System Sensor model PC4R Fire Horn/Strobe or equivalent, that features a selectable light level between 15cd and 115cd. The Horn/Strobe shall feature a polarized power input. If the Horn/Strobe is removed from the NAC circuit, the system shall send a supervisory report to the monitoring station. The Fire Horn/Strobe shall be UL Listed, FM approved, CSFM listed and MEA listed for the application. The installer shall install the fire Horn/Strobe as directed by the manufacturer's installation instructions.

32. Ceiling Mounted, Indoor 2-Wire, Fire Horn/Strobes: In the event of a fire alarm on the system, the control panel shall sound an outdoor System Sensor model PC2R Fire Horn/Strobe or equivalent, that features a selectable light level between 15cd and 115cd. The Horn/Strobe shall feature a polarized power input. If the Horn/Strobe is removed from the NAC circuit, the system shall send a supervisory report to the monitoring station. The Fire Horn/Strobe shall be UL Listed, FM approved, CSFM listed and MEA listed for the application. The installer shall install the fire Horn/Strobe as directed by the manufacturer's installation instructions.

33. Outdoor Fire Horns: In the event of a fire alarm on the system, the control panel shall sound a System Sensor model BK-HRK 12/24VDC Outdoor Fire Horn or equivalent, that features a sound level of 67-77dB at 20 feet. The horn shall feature a polarized power input If the siren is removed from the NAC circuit, the system shall send a supervisory report to the monitoring station. The Fire Horn shall be UL Listed, FM approved, CSFM listed and MEA listed for the application. The installer shall install the fire horn as directed by the manufacturer's installation instructions.

34. Wall Mounted, Multi-Candela Strobes Notification Appliances: In the event of a fire alarm on the system, the control panel shall activate a System Sensor model BK-SRK Outdoor Fire Strobe or equivalent, that features a candela setting specified between 15cd and 115cd. The strobe shall feature a polarized power input. If the strobe is removed from the NAC circuit, the system shall send a supervisory report to the monitoring station. The Fire strobe shall be UL Listed, FM approved, CSFM listed and MEA listed for the application. The installer shall install the fire strobe as directed by the manufacturer's installation instructions.

35. Wall Mounted, Outdoor 4-Wire, Outdoor Fire Horn/Strobes: In the event of a fire alarm on the system, the control panel shall sound an outdoor System Sensor model P4RK Fire Horn/Strobe or equivalent, that features a selectable light level between 15cd and 115cd. The Horn/Strobe shall feature a polarized power input. If the Horn/Strobe is removed from the NAC circuit, the system shall send a supervisory report to the monitoring station. The Fire Horn/Strobe shall be UL Listed, FM approved, CSFM listed and MEA listed for the application. The installer shall install the fire Horn/Strobe as directed by the manufacturer's installation instructions.

36. Wall Mounted, Outdoor 2-Wire, Outdoor Fire Horn/Strobes: In the event of a fire alarm on the system, the control panel shall sound an outdoor System Sensor model BK-P2RK Fire Horn/Strobe or equivalent, that features a selectable light level between 15cd and 115cd. The Horn/Strobe shall feature a polarized power input. If the Horn/Strobe is removed from the NAC circuit, the system shall send a supervisory report to the monitoring station. The Fire Horn/Strobe shall be UL Listed, FM approved, CSFM listed and MEA listed for the application. The installer shall install the fire Horn/Strobe as directed by the manufacturer's installation instructions.

37. Ceiling Mounted, Outside, Multi-Candela Strobe Notification Appliances: In the event of a fire alarm on the system, the control panel shall activate a System Sensor model BK-SCRK Fire Strobe or equivalent, that features a candela setting specified between 15cd and 115cd. The strobe shall feature a polarized power input. If the strobe is removed from the NAC circuit, the system shall send a supervisory report to the monitoring station. The Fire strobe shall be UL Listed, FM approved, CSFM listed and MEA listed for the application. The installer shall install the fire strobe as directed by the manufacturer's installation instructions.

38. Ceiling Mounted, Outdoor 4-Wire, Fire Horn/Strobes: In the event of a fire alarm on the system, the control panel shall sound an outdoor System Sensor model PC4RK Fire Horn/Strobe or equivalent, that features a selectable light level between 15cd and 115cd. The Horn/Strobe shall feature a polarized power input. If the Horn/Strobe is removed from the NAC circuit, the system shall send a supervisory report to the monitoring station. The Fire Horn/Strobe shall be UL Listed, FM approved, CSFM listed and MEA listed for the application. The installer shall install the fire Horn/Strobe as directed by the manufacturer's installation instructions.

39. Ceiling Mounted, Indoor 2-Wire, Outdoor Fire Horn/Strobes: In the event of a fire alarm on the system, the control panel shall sound an outdoor System Sensor model BK- PC2RK Fire Horn/Strobe or equivalent, that features a selectable light level between 15cd and 115cd. The Horn/Strobe shall feature a polarized power input. If the Horn/Strobe is removed from the NAC circuit, the system shall send a

supervisory report to the monitoring station. The Fire Horn/Strobe shall be UL Listed, FM approved, CSFM listed and MEA listed for the application. The installer shall install the fire Horn/Strobe as directed by the manufacturer's installation instructions.

40. HVAC Fan Shutdown: Include a connection to each HVAC Fan as required by UL, NFPA, and local building codes. The HVAC Fan shutdown trigger shall be connected to a 4101SN relay output module or equivalent.

41. Fire Alarm Integration with Access Controlled Doors: The system shall automatically unlock designated access controlled doors to ensure exit routes during fire alarm activations as recommended by UL, NFPA, and local building codes.

42. Fire System Smoke Detectors with Heat Sensors: Selected areas in the facility will use Smoke detectors to sense the buildup of Smoke caused by fires and smoldering objects. The quantity and spacing of detectors shall meet those suggested by UL, NFPA and other recognized agencies and building codes. Locations for Smoke detectors may be in hallways, laboratories, server rooms, classrooms or other areas where required. For each Smoke detector, install a Honeywell 5193SDT Smoke detector.

43. Fire System Smoke Detectors, 2-Wire: Selected areas in the facility will use Smoke detectors to sense the buildup of Smoke caused by fires and smoldering objects. The quantity and spacing of detectors shall meet those suggested by UL, NFPA and other recognized agencies and building codes. Locations for Smoke detectors may be in hallways, laboratories, server rooms, classrooms or other areas where required. For each Smoke detector, install a System Sensor 2WB-T Smoke detector or equivalent.

44. Fire System Smoke Detectors, Thermal Sensor, 2-Wire: Selected areas in the facility will use Smoke detectors to sense the buildup of Smoke caused by fires and smoldering objects. The smoke detector shall also feature a spot heat sensor rated at 135°F. The quantity and spacing of detectors shall meet those suggested by UL, NFPA and other recognized agencies and building codes. Locations for Smoke detectors may be in hallways, laboratories, server rooms, classrooms or other areas where required. For each Smoke detector, install a System Sensor 2WB-T Smoke detector or equivalent.

45. Fire System Smoke Detectors, 4-Wire: Selected areas in the facility will use Smoke detectors to sense the buildup of Smoke caused by fires and smoldering objects. The quantity and spacing of detectors shall meet those suggested by UL, NFPA and other recognized agencies and building codes. Locations for Smoke detectors may be in hallways, laboratories, server rooms, classrooms or other areas where

required. For each Smoke detector, install a System Sensor 4WB-T Smoke detector or equivalent.

46. Fire System Heat Detectors, 194°F Fixed, V-Plex: Selected areas in the facility will use heat detectors to sense the sudden outbreak of fires. The quantity and spacing of detectors shall meet those suggested by UL, NFPA and other recognized agencies and building codes. Locations for Heat detectors may be in hallways, parking garages, utility rooms, laboratories, server rooms, classrooms or other areas where required. For each heat detector, install a System Sensor 5604 heat detector or equivalent.

47. Fire System Heat Detectors, 194°F Fixed, Wireless: Selected areas in the facility will use heat detectors to sense the sudden outbreak of fires. The quantity and spacing of detectors shall meet those suggested by UL, NFPA and other recognized agencies and building codes. Locations for Heat detectors may be in hallways, parking garages, utility rooms, laboratories, server rooms, classrooms or other areas where required. For each heat detector, install a System Sensor 5604 heat detector or equivalent.

48. Fire System Heat Detectors, 194°F Fixed and Rate of Rise, V-Plex: Selected areas in the facility will use heat detectors to sense the sudden outbreak of fires. The quantity and spacing of detectors shall meet those suggested by UL, NFPA and other recognized agencies and building codes. Locations for Heat detectors may be in hallways, parking garages, utility rooms, laboratories, server rooms, classrooms or other areas where required. For each heat detector, install a System Sensor 5604 heat detector or equivalent.

49. Fire System Heat Detectors, 194°F Fixed and Rate of Rise, Wireless: Selected areas in the facility will use heat detectors to sense the sudden outbreak of fires. The quantity and spacing of detectors shall meet those suggested by UL, NFPA and other recognized agencies and building codes. Locations for Heat detectors may be in hallways, parking garages, utility rooms, laboratories, server rooms, classrooms or other areas where required. For each heat detector, install a System Sensor 5604 heat detector or equivalent.

50. Fire System Heat Detectors, 135°F Fixed and Rate of Rise, V-Plex: Selected areas in the facility will use heat detectors to sense the sudden outbreak of fires. The quantity and spacing of detectors shall meet those suggested by UL, NFPA and other recognized agencies and building codes. Locations for Heat detectors may be in hallways, parking garages, utility rooms, laboratories, server rooms, classrooms or other areas where required. For each heat detector, install a System Sensor 5604 heat detector or equivalent.

51. Manual Pull Stations, Dual Action, V-Plex: Include manual fire alarm stations near exits, stairwells, and other locations recommended by UL, NFPA, and local building codes. The manual pull station shall be the Honeywell Model 5140MPS-2 and a 4193SNP zone input module or equivalent.

52. Manual Pull Stations, Dual Action, Wireless: Include manual fire alarm stations near exits, stairwells, and other locations recommended by UL, NFPA, and local building codes. The manual pull station shall be the Honeywell Model 5140MPS-2 and a 5817CB Transmitter or equivalent.

53. OS&Y Valves: Monitor tamper switches inside of OS&Y or other designated Fire Suppression System control valves. The OS&Y valve shall connect to a zone input module or a zone input on the FACP.

54. OS&Y Valves, Wireless: Monitor tamper switches inside of OS&Y or other designated Fire Suppression System control valves. The OS&Y valve shall connect to a zone input module or a zone input on the FACP.

55. Fire Alarm Supervisory Devices, V-Plex: Include a connection to each initiating device to supervise its idle, trouble, and alarm statuses as required by UL, NFPA, and local building codes. The fire supervisory device alarm and trouble outputs shall be connected to a 4193SNP zone input module or equivalent.

56. Fire Alarm Supervisory Devices, Wireless: Include a connection to each initiating device to supervise its idle, trouble, and alarm statuses as required by UL, NFPA, and local building codes. The fire supervisory device alarm and trouble outputs shall be connected to a 5817CB Wireless Transmitter or equivalent.

57. Hood Fire Suppression, Wireless: Include a connection to each stove hood suppression alarm to supervise its charge and discharge statuses as required by UL, NFPA, and local building codes. The hood suppression system alarm and trouble outputs shall be connected to a 5817CB zone input module or equivalent.

58. Combined AlarmNet-I (Internet) and AlarmNet-GSM (Global System for Mobile) Fire Alarm Communication: The facility system shall be monitored using both the AlarmNet-I and the AlarmNet-G Communication services. The system shall use Honeywell's AlarmNet IGSMCF Fire Alarm transmitter or equivalent. The communication service shall employ a two-way Internet connection through AlarmNet Communication Service as the primary method of communication, and then the two-way GPRS (General Packet Radio Service) as the secondary means of communication and shall use SMS (Short Message Service) as a tertiary means of communication. The equipment shall be UL listed for use in this application. The installer shall follow manufacturer's instructions when installing the AlarmNet unit.

59. Fire Pump Diesel: Monitor the status of the Automatic Fire Suppression Water Pump Controller using zone inputs on the system.

60. Isolation for the ECP bus: Include an ECP-ISO isolation device or equivalent to protect fire Annunciators and communication devices from distant shorts or overloaded conditions on the ECP Bus.

61. Fire Alarm Initiating Devices: Include a connection to each initiating device to supervise its idle, trouble, and alarm statuses as required by UL, NFPA, and local building codes. The fire initiating device alarm and trouble outputs shall be connected to a 4193SNP zone input module or equivalent.

62. VSI Bus Isolation and Integrity: System V-Plex bus branch circuits shall be isolated from one another so that a shorted, overloaded, or grounded branch circuit is isolated away from other near-side branch circuits, allowing undamaged V-Plex bus circuits to continue to operate. VSI Isolation modules shall be installed at near-side connections to cable runs leading to additional buildings, at cable runs leading to additional floors in multi-story buildings, and at junction boxes leading to multiple V-Plex branch circuits within the system. The installer shall use the Honeywell VPLEX-VSI module or equivalent.

63. Zone Input: System zone inputs allow the system to sense the change in state of an output from an external device, such as a door/window position sensor, a motion detector, a relay output from an appliance, the output of an external alert system, or other devices that provide a dry closure output.

64. Leak, Flood, Water Level: Monitor the level of water in a designated location. The installer shall install a Honeywell Model 470-12 Water Sensor or equivalent. The owner may monitor air conditioning duct drip pans, areas beneath water heaters and tanks, refrigeration drain basins, sump pumps, basements, or restrooms. The installer shall follow manufacturer instructions while installing and programming system equipment.

65. Hollow Steel Frame Doors: Monitor the opened and closed position of doors in the facility. The installer shall install a Honeywell Model 4191SN-WH Recessed 1/2” sensor, equipped with the steel door adapter or equivalent. The installer shall follow manufacturer instructions while installing and programming system equipment.

66. Filled Steel Frame Doors: Monitor the opened and closed position of doors in the facility. The installer shall install a Honeywell Model 960 Door sensor, and a 4193SNP or equivalent. The installer shall follow manufacturer instructions while installing and programming system equipment.

67. Wood Frame Doors: Monitor the opened and closed position of doors in the facility. The installer shall install a Honeywell Model 4191SN-WH Recessed ½" sensor or equivalent. The installer shall follow manufacturer instructions while installing and programming system equipment.

68. Roof Hatches: Monitor the opened and closed position of hatches and access doors to the roof of the facility. The installer shall install a Honeywell Model 960 Armored Door Sensor, or equivalent. The installer shall follow manufacturer instructions while installing and programming system equipment.

69. Overhead Doors: Monitor the opened and closed position of overhead bay doors in the facility. The installer shall install a Honeywell Model 4959SN Overhead Door sensor, or equivalent. The installer shall follow manufacturer instructions while installing and programming system equipment.

70. Temperature Threshold Detector: Selected areas in the facility will use Temperature Threshold detectors to sense high or low level temperatures within a designated area. Locations for Temperature Threshold detectors may be in kitchens, laboratories, server rooms, classrooms or other areas where temperature threshold notification is critical. For each Temperature Threshold detector, install a Honeywell zone input module and a Honeywell TS300 Temperature Threshold detector or equivalent, and an appropriate power supply.

71. Carbon Monoxide Detector, V-Plex: Selected areas in the facility will use carbon monoxide detectors to sense high levels of carbon monoxide. Locations for carbon monoxide detectors may be in parking garages, kitchens, laboratories, near fireplaces, or in natural gas fueled heater closets. For each carbon monoxide detector, install a Honeywell 4193SNP zone input module and a System Sensor CO1224 Carbon Monoxide detector or equivalent, and an appropriate power supply.

72. Natural Gas Detector: Selected areas in the facility will use natural gas detectors to sense high levels of natural gas. Locations for natural gas detectors may be in kitchens, laboratories, near fireplaces, or in natural gas fueled heater closets. For each natural gas detector, install a Honeywell zone input module and a Pama DW-200012UL natural gas detector or equivalent, and an appropriate power supply.

73. Glass Break Detector, V-Plex: Selected areas in the protected site will use glass-break detectors to sense the breaking of windows. Where designated in the plans, install a Honeywell Model FG1625SN Glass Break detector or equivalent. The installer shall follow manufacturer's instructions when installing, testing and programming system equipment.

74. Dual-Tec Motion Detector, Wall-Mounted, V-Plex: Selected areas in the protected site will use motion detectors to sense motion in rooms or areas of rooms. Where designated in the plans, install a Honeywell Model DT7500SN V-Plex Dual-Tec Motion Detector or equivalent. The DUAL TEC motion detector and fire alarm control panel shall be compatible with the Smart Contact feature.

75. Passive Infrared Motion Detector, Ceiling-mounted, V-Plex: Selected areas in the protected site will use motion detectors to sense motion in rooms or areas of rooms. Where designated in the plans, install a Honeywell Model IS280CM Ceiling Mounted Passive Infrared Motion Detector or equivalent, and a 4193SNP zone input module.

76. Panic Buttons: Include manual panic buttons under desks, in storage rooms, in walk-in refrigeration units and other designated locations. The panic button shall be the Honeywell Model 269SN or equivalent.

77. Keypad, Alpha Display: The system keypad shall include a two-line, alphanumeric LCD display. Use the Honeywell Vista 6160 keypad or equivalent. The installer shall follow manufacturer's installation instructions when installing system equipment.

78. Keypad: Color Graphic Touch Screen Display: The system keypad shall employ a dynamic, interactive graphic touch screen display. Use the Honeywell Vista 6280 keypad or equivalent. The installer shall follow manufacturer's installation instructions when installing system equipment.

79. Keypad: Color Graphic Touch Screen Display with ZWave integration: The system keypad shall employ a dynamic, interactive graphic touch screen display. Use the Honeywell TUXEDO series keypad or equivalent. The installer shall follow manufacturer's installation instructions when installing system equipment.

80. Automatic Door Locking: Selected doors in the facility will use system automatic door locking capabilities to restrict entry to into the facility, yet allow free exit by those who have completed their business. For each automatic locking door, install a 4101SN relay output module, a power supply, and an electric locking device.

81. Automatic Door Holders: Selected doors in the facility will use system automatic door holder capabilities to hold doors open until particular system events release the door. For each automatic locking door, install a 4101SN relay output module, a power supply, and an electric magnetic door holder device.

82. Energy Management: The system shall be connected to the central EMS system for the purposes of affecting the operation of heat and air conditioning appliances when the partition is armed.

83. Energy Management: The system shall be connected to each HVAC thermostat for the purposes of disabling heat and air conditioning appliances when the partition is armed.

84. Refrigeration Temperature Threshold Detector: Selected refrigeration units in the facility will use Temperature Threshold detectors to sense high temperature levels. Locations for Temperature Threshold detectors may be in kitchens, laboratories, For each Temperature Threshold detector, install a Honeywell 4193SNP zone input module and a Honeywell TS300 Temperature Threshold detector or equivalent, and an appropriate power supply.

85. Optiflex Video Camera System: Include an integrated video system. Use the Honeywell Optiflex Network Video or equivalent. The Video system shall be capable of being displayed on suitable system keypads. The Video system shall be capable of being viewed from a distant network location by way of a browser, or by video software. The Video system shall provide up to six camera inputs and an NTSC video output. The Video system shall be capable of storing up to 19, 10-frame event clips that can be retrieved by way of software. The system shall not require the use of a DVR. The installer shall follow manufacturer's installation instructions when installing system equipment.

86. Wireless Door Sensors for Wood Jambs: Include Wireless Door Sensors for Wood Jamb Doors where designated. When the door is opened and closed, the wireless door sensor shall send messages indicating the state of the door to the control panel. Each wireless transmitter shall send periodic check-in signals to its associated control panel. The door sensor's associated control panel shall report any missing door sensor within four and one-half hours. Each transmitter shall report any low battery condition a minimum of seven days before its battery becomes too discharged to power the transmitter. Each door sensor shall include an internal tamper switch, and shall send a tamper alert to the control panel when removed from its installed location. The transmitter's associated control panel shall report any low battery condition by providing a local indication at system keypads, and shall send a trouble report to the central monitoring station. The model number of the wireless door sensor is the 5818MNL or equivalent.

87. Wireless Door Sensors for Hollow Metal Door Frames: Include Wireless Door Sensors for Hollow Metal Jamb Doors where designated. The when the door is opened and closed, the wireless door sensor shall send messages indicating the state of the door to the control panel. Each wireless transmitter shall send periodic check-in signals to its associated control panel. The door sensor's associated control panel shall report any missing door sensor within four and one-half hours. Each transmitter shall report any low battery condition a minimum of seven days before its battery

becomes too discharged to power the transmitter. Each door sensor shall include an internal tamper switch, and shall send a tamper alert to the control panel when removed from its installed location. The transmitter's associated control panel shall report any low battery condition by providing a local indication at system keypads, and shall send a trouble report to the central monitoring station. The model number of the door sensor is the 947-75 and the 5816 Wireless transmitter or equivalent.

88. Wireless Door Sensors for Hollow Metal Door Frames: Include Wireless Door Sensors for Hollow Metal Jamb Doors where designated. The when the door is opened and closed, the wireless door sensor shall send messages indicating the state of the door to the control panel. Each wireless transmitter shall send periodic check-in signals to its associated control panel. The door sensor's associated control panel shall report any missing door sensor within four and one-half hours. Each transmitter shall report any low battery condition a minimum of seven days before its battery becomes too discharged to power the transmitter. Each door sensor shall include an internal tamper switch, and shall send a tamper alert to the control panel when removed from its installed location. The transmitter's associated control panel shall report any low battery condition by providing a local indication at system keypads, and shall send a trouble report to the central monitoring station. The model number of the door sensor is the 947-75 and the 5816 Wireless transmitter or equivalent.

89. Wireless Door Sensors for Roof Hatches: Include Wireless Door Sensors for Roof Hatches where designated. The when the door is opened and closed, the wireless door sensor shall send messages indicating the state of the door to the control panel. Each wireless transmitter shall send periodic check-in signals to its associated control panel. The door sensor's associated control panel shall report any missing door sensor within four and one-half hours. Each transmitter shall report any low battery condition a minimum of seven days before its battery becomes too discharged to power the transmitter. Each wireless transmitter shall include an internal tamper switch, a back tamper switch, and shall send a tamper alert to the control panel when removed from its installed location, or when opened. The transmitter's associated control panel shall report any low battery condition by providing a local indication at system keypads, and shall send a trouble report to the central monitoring station. The model number of the door sensor is the Ademco 960 and the 5816 Wireless transmitter or equivalent.

90. Wireless Door Sensors for Overhead Rollup Doors: Include Wireless Door Sensors for Overhead Rollup Doors where designated. The when the door is opened and closed, the wireless door sensor shall send messages indicating the state of the door to the control panel. Each wireless transmitter shall send periodic check-in signals to its associated control panel. The door sensor's associated control panel shall report any missing door sensor within four and one-half hours. Each transmitter shall report

any low battery condition a minimum of seven days before its battery becomes too discharged to power the transmitter. Each wireless transmitter shall include an internal tamper switch, a back tamper switch, and shall send a tamper alert to the control panel when removed from its installed location, or when opened. The transmitter's associated control panel shall report any low battery condition by providing a local indication at system keypads, and shall send a trouble report to the central monitoring station. The model number of the door sensor is the Ademco 957 and the 5816 Wireless transmitter or equivalent.

91. Dual-Tec Motion Detector, Wall-mounted, Wireless: Selected areas in the protected site will use motion detectors to sense motion in rooms or areas of rooms. Where designated in the plans, install a Honeywell Model 5898 Wireless Motion Detector or equivalent.

92. Glass Break Detector, Wireless: Selected areas in the protected site will use glass-break detectors to sense the breaking of windows. Where designated in the plans, install a Honeywell Model 5853 Glass Break detector or equivalent. The installer shall follow manufacturer's instructions when installing, testing and programming system equipment.

93. Wireless Panic Button: Include Wireless Panic Button at designated locations. The when the Panic Button is triggered into alarm, the wireless transmitter shall send a message to the control panel. Each wireless Panic Button shall send periodic check-in signals to its associated control panel. The Panic Button's associated control panel shall report any missing Panic Button within four and one-half hours. Each Panic Button shall report any low battery condition a minimum of seven days before its battery becomes too discharged to power the transmitter. The Panic Button's associated control panel shall report any low battery condition by providing a local indication at system keypads, and shall send a trouble report to the central monitoring station. The wireless Panic Button shall include a cover tamper switch and a rear tamper switch so that it shall send a tamper alarm in the event that the Panic Button's cover is removed, or if the Panic Button is removed from its mounting surface. The model number of the wireless Panic Button is the 5802WXT or equivalent.

94. Vibration Sensors: Include Vibration Sensors where designated. When the sensor detects vibration, the sensor shall send messages indicating the fault to the control panel. Each vibration sensor shall report a trouble condition if disconnected from its zone expander. The model number of the vibration sensor is the Ademco 11 or equivalent.

95. Wireless Receivers for Commercial Applications: Include Commercial Wireless Receivers where designated. The wireless receiver shall be UL Listed, Factory Mutual Approved, MEA Listed, and CSFM Listed for the application. The wireless receiver shall receive messages from wireless devices indicating device detection loop open, normal, shorted, tamper alarm, and low battery status when sent from transmitters associated with the system. Each wireless transmitter shall send periodic check-in signals to its associated control panel. The transmitter's associated control panel shall report any missing transmitter within four and one-half hours. Each transmitter shall report any low battery condition a minimum of seven days before its battery becomes too discharged to power the transmitter. The transmitter's associated control panel shall report any low battery condition by providing a local indication at system keypads, and shall send a trouble report to the central monitoring station. The model number of the receiver is Honeywell 5881ENHC or equivalent.

96. Wireless Repeaters for Commercial Applications: Include Commercial Wireless Repeaters where designated. The wireless repeater shall be UL Listed for the application. The wireless repeater shall receive and forward messages from wireless devices indicating device detection loop open, normal, shorted, tamper alarm, and low battery status when sent from transmitters associated with the system. Each wireless transmitter shall send periodic check-in signals to its associated control panel. The transmitter's associated control panel shall report any missing transmitter within four and one-half hours. Each transmitter shall report any low battery condition a minimum of seven days before its battery becomes too discharged to power the transmitter. The transmitter's associated control panel shall report any low battery condition by providing a local indication at system keypads, and shall send a trouble report to the central monitoring station. The model number of the repeater is Honeywell 5800RP or equivalent.

97. Wood Doors and Windows, Exposed, V-Plex: Monitor the opened and closed position of doors and windows in the facility. The installer shall install a Honeywell Model 4939SN Exposed Addressable Sensor, or equivalent. The installer shall follow manufacturer instructions while installing and programming system equipment.

98. Wood Frame Doors and Windows, Exposed, Wireless: Monitor the opened and closed position of doors in the facility. The installer shall install a Honeywell Model 7939WG Exposed Door Sensor, or equivalent. The installer shall follow manufacturer instructions while installing and programming system equipment.

99. Hatch Doors, Exposed, V-Plex: Monitor the opened and closed position of doors in the facility. The installer shall install a Honeywell Model 4939SN Exposed Addressable Sensor, or equivalent. The installer shall follow manufacturer instructions while installing and programming system equipment.

100. Hatch Doors, Exposed, Wireless: Monitor the opened and closed position of hatches in the facility. The installer shall install a Honeywell Model 7939WG Exposed Sensor, or equivalent. The installer shall follow manufacturer instructions while installing and programming system equipment.

101. Energy Management and Remote Control by Telephone: The system shall be connected to each HVAC thermostat for the purposes of disabling heat and air conditioning appliances when the partition is armed. Using the 4500 Thermostat Interface and the 4286 Phone module, the system shall allow users to call the protected site and make adjustments to the temperature of the building.

102. Filled Metal Doors and Windows, Exposed, V-Plex: Monitor the opened and closed position of doors and windows in the facility. The installer shall install a Honeywell Model 4939SN Exposed Addressable Sensor, or equivalent. The installer shall follow manufacturer instructions while installing and programming system equipment.

103. Filled Metal Frame Doors and Windows, Wireless: Monitor the opened and closed position of doors and windows in the facility. The installer shall install a Honeywell Model 7939WG Exposed sensor, or equivalent. The installer shall follow manufacturer instructions while installing and programming system equipment.

104. Hollow Metal Doors and Windows, Exposed, V-Plex: Monitor the opened and closed position of doors and windows in the facility. The installer shall install a Honeywell Model 4939SN Exposed Addressable Sensor, or equivalent. The installer shall follow manufacturer instructions while installing and programming system equipment.

105. Server Room Alert Systems : The system shall be provide sensing of critical conditions within the server room. The system shall alert the user when the temperature is too high, when the humidity is too high, when air conditioning condensation drip pans require draining and when there is an extended power failure.

106. Kitchen Alert Systems : The system shall be provide sensing of critical conditions within the kitchen or food processing facility. The system shall alert the user when the temperature is too high, when the humidity is too high, when air conditioning condensation drip pans require draining and when there is an extended power failure.

107. Natural Gas Detector: Selected areas in the facility will use natural gas detectors to sense high levels of natural gas. Locations for natural gas detectors may be in kitchens, laboratories, near fireplaces, or in natural gas fueled heater closets. For each natural gas detector, install a Honeywell zone input module and a Pama DW-200012UL natural gas detector or equivalent, and an appropriate power supply.

108. Safe or Vault Protection: Monitor the status of the Safe. For each Safe, the installer shall provide complete protection integrated with the system.

109. Vending Machine Protection: Monitor the status of the Vending Machine. For each Vending Machine, the installer shall provide complete protection integrated with the system.

110. Gas Water Heater Alert Systems : The system shall be provide sensing of critical conditions within the water heater room. The system shall alert the user in the event of natural gas leaks, carbon monoxide presence, and in the event of water leaks.

111. Photo Beam, 100 Feet, V-Plex: Monitor the status of photo beam units installed in the facility. The installer shall install a Honeywell Model CK-IB100D Photo Beam Sensor, or equivalent. The installer shall follow manufacturer instructions while installing and programming system equipment.

112. Photo Beam, 250 Feet, V-Plex: Monitor the status of photo beam units installed in the facility. The installer shall install a Honeywell Model CK-IB250S Photo Beam Sensor, or equivalent. The installer shall follow manufacturer instructions while installing and programming system equipment.

113. Hollow Metal Frame Doors and Windows, Exposed, Wireless: Monitor the opened and closed position of doors and windows in the facility. The installer shall install a Honeywell Model 7939WG Exposed Sensor, or equivalent. The installer shall follow manufacturer instructions while installing and programming system equipment.

114. Hollow Metal Frame Doors and Windows, Exposed, Armored, V-Plex: Monitor the opened and closed position of doors and windows in the facility. The installer shall install a Honeywell Model 960 Armored Door Sensor, or equivalent. The installer shall follow manufacturer instructions while installing and programming system equipment.

115. Wood Frame Doors and Windows, Exposed, Armored, V-Plex: Monitor the opened and closed position of doors and windows in the facility. The installer shall install a Honeywell Model 960 Armored Door Sensor, or equivalent. The installer shall follow manufacturer instructions while installing and programming system equipment.

116. Passive Infrared Motion Detector, Wall-Mounted, Wireless: Selected areas in the protected site will use motion detectors to sense motion in rooms or areas of rooms. Where designated in the plans, install a Honeywell Model 5800-COM Wireless Motion Detector or equivalent.

117. Passive Infrared Motion Detector, Ceiling-Mounted, V-Plex: Selected areas in the protected site will use motion detectors to sense motion in rooms or areas of

rooms. Where designated in the plans, install a Honeywell Model 997 Passive Infrared Motion Detector or equivalent.

118. Passive Infrared Motion Detector, Wall-Mounted, V-Plex: Selected areas in the protected site will use motion detectors to sense motion in rooms or areas of rooms. Where designated in the plans, install a Honeywell Model S2500SN V-Plex PIR Motion Detector or equivalent.

119. Dual-Tec Motion Detector, Wall-Mounted, Curtain, Wireless: Selected areas in the protected site will use motion detectors to sense motion in rooms or areas of rooms. Where designated in the plans, install a Honeywell Model 5898 Wireless Motion Detector or equivalent.

120. Dual-Tec Motion Detector, Anti-Mask, Wall-Mounted, V-Plex: Selected areas in the protected site will use motion detectors to sense motion in rooms or areas of rooms. Where designated in the plans, install a Honeywell Model DT-7500SN Dual-Tec Motion Detector or equivalent with anti-mask detection capabilities.

121. Glass Break Detector, Flush Mount, V-Plex: Selected areas in the protected site will use glass-break detectors to sense the breaking of windows. Where designated in the plans, install a Honeywell Model FG1625F Flush-mount Glass Break detector or equivalent. The installer shall follow manufacturer's instructions when installing, testing and programming system equipment.

122. Glass Break Detector, V-Plex, Flush-Mounted, Concealed: Selected areas in the protected site will use concealed glass-break detectors to sense the breaking of windows. Where designated in the plans, install a Honeywell Model FG1625RFM Glass Break detector or equivalent. The installer shall follow manufacturer's instructions when installing, testing and programming system equipment.

123. Holdup Device, Bill Trap, V-Plex: Include Bill Trap Devices inside of money drawers in the checkout stand. The Bill trap devices be the Honeywell Model 264 or equivalent.

124. Holdup Device: Bill Trap, Wireless: Include Bill Trap Devices inside of money drawers in the checkout stand. The Bill trap devices must be the Honeywell Model 264 or equivalent.

125. Holdup Device, Foot Rail, V-Plex: Include Foot Rail Devices on the floor below the customer service station or below designated desks within the protected location. The Foot Rail devices must be the Honeywell Model 266 or equivalent.

126. Holdup Device, Foot Rail, Wireless: Include Foot Rail Devices on the floor below the customer service station or below designated desks within the protected location. The Foot Rail devices must be the Honeywell Model 266 or equivalent.

127. Wireless Panic Button: Include Wireless Panic Button at designated locations. The when the Panic Button is triggered into alarm, the wireless transmitter shall send a message to the control panel. Each wireless Panic Button shall send periodic check-in signals to its associated control panel. The Panic Button's associated control panel shall report any missing Panic Button within four and one-half hours. Each Panic Button shall report any low battery condition a minimum of seven days before its battery becomes too discharged to power the transmitter. The Panic Button's associated control panel shall report any low battery condition by providing a local indication at system keypads, and shall send a trouble report to the central monitoring station. The wireless Panic Button shall include a cover tamper switch and a rear tamper switch so that it shall send a tamper alarm in the event that the Panic Button's cover is removed, or if the Panic Button is removed from its mounting surface. The model number of the wireless Panic Button is the 5802WXT-2 2-button panic transmitter or equivalent.

128. Siren, Outdoor, High Output in Enclosure: Monitor the status of protected openings and areas in the armed and disarmed state. When an audible alarm occurs, the system shall sound a Honeywell Model 702 Siren or equivalent inside of the Model 743BE Enclosure. The installer shall install the siren as directed by manufacturer instructions.

129. Siren Enclosure, Outdoor, Large: For large sirens, the system shall be mounted inside of the Model 743BE Enclosure. The installer shall install the siren as directed by manufacturer instructions.

130. Siren Indoor/Outdoor in Enclosure: Monitor the status of protected openings and areas in the armed and disarmed state. When an audible alarm occurs, the system shall sound a Honeywell Model 719 Siren or equivalent located inside a 742BE Enclosure. The installer shall install the siren as directed by manufacturer instructions.

131. Siren Enclosure Indoor/Outdoor: 719 Sirens shall be enclosed in a 742BE Enclosure. The installer shall install the siren as directed by manufacturer instructions.

132. Siren Indoor/Outdoor: Monitor the status of protected openings and areas in the armed and disarmed state. When an audible alarm occurs, the system shall sound a Honeywell Model 748LC Siren or equivalent. The installer shall install the siren as directed by manufacturer instructions.

133. Siren Indoor, Wireless: Monitor the status of protected openings and areas in the armed and disarmed state. When an audible alarm occurs, the system shall sound a Honeywell Model 5800WAVE Wireless Siren or equivalent. The installer shall install the siren as directed by manufacturer instructions.

134. Siren Indoor: Monitor the status of protected openings and areas in the armed and disarmed state. When an audible alarm occurs, the system shall sound a Honeywell Model Wave2 Siren or equivalent. The installer shall install the siren as directed by manufacturer instructions.

135. Siren Indoor, Flush Mount: Monitor the status of protected openings and areas in the armed and disarmed state. When an audible alarm occurs, the system shall sound a Honeywell Model Wave2F Siren or equivalent. The installer shall install the siren as directed by manufacturer instructions.

136. Strobe, Indoor/Outdoor: Monitor the status of protected openings and areas in the armed and disarmed state. When an alarm occurs, the system shall indicate the alarm with a Honeywell Model 710 Strobe or equivalent. The installer shall install the strobe as directed by manufacturer instructions.

137. Leak, Flood, Water Level, Wireless: Monitor the level of water in a designated location. The installer shall install a Honeywell Model 5821 Water Sensor with a 470PB remote probe or equivalent. The owner may monitor air conditioning duct drip pans, areas beneath water heaters and tanks, refrigeration drain basins, sump pumps, basements, or restrooms. The installer shall follow manufacturer instructions while installing and programming system equipment.

138. Temperature Threshold Detector, Wireless: Selected areas in the facility will use Temperature Threshold detectors to sense high or low level temperatures within a designated area. Locations for Temperature Threshold detectors may be in kitchens, laboratories, server rooms, classrooms or other areas where temperature threshold notification is critical. For each Temperature Threshold detector, install a Honeywell 5821 wireless temperature alarm transmitter and a Honeywell TS280R Temperature probe or equivalent.

139. Carbon Monoxide Detector, Wireless: Selected areas in the facility will use carbon monoxide detectors to sense high levels of carbon monoxide. Locations for carbon monoxide detectors may be in parking garages, kitchens, laboratories, near fireplaces, or in natural gas fueled heater closets. For each carbon monoxide detector, install a Honeywell 5800CO Carbon Monoxide detector or equivalent.

140. Holdup Device: Two-button, Conventional: Include Two-button Holdup Devices at customer windows. The holdup devices shall be the Honeywell Model 268 two-button holdup button or equivalent.

141. Asset Protection, Wireless: Selected indoor assets within the protected site will use wireless indoor asset protection devices to sense protected object Asset Protection.

Where designated in the plans, install a Honeywell Model 5870API Wireless Asset Detector or equivalent.

142. Outdoor Passive Infrared Motion Detector, Wall, Post, or Pole-mounted, Wireless: Selected outdoor areas in the protected site will use outdoor motion detectors to sense motion. Where designated in the plans, install a Honeywell Model 5800PIR-OD Wireless Motion Detector or equivalent.

143. Premium Keypad, Alpha Display: The system keypad shall include a two-line, reverse display alphanumeric LCD display. Use the Honeywell Vista 6460 keypad or equivalent. The installer shall follow manufacturer's installation instructions when installing system equipment.

144. Portrait-style Keypad, Alpha Display: The system keypad shall include a two-line, reverse display alphanumeric LCD display. Use the Honeywell Vista 6165EX Portrait-style keypad or equivalent. The installer shall follow manufacturer's installation instructions when installing system equipment.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine site conditions prior to installation. Notify Architect and Owner in writing if unsuitable conditions are encountered. Do not start installation until site conditions are acceptable.

3.2 INSTALLATION

A. Intrusion detection and fire alarm control panel system shall be installed and tested in accordance with manufacturer's installation instructions.

1. Coordinate interfaces with Owner's representative where appropriate.

2. Provide backboxes, pullboxes, connectors, supports, conduit, cable, and wire for a complete and reliable installation. Obtain Owner's approval for exact location of all boxes, conduit, and wiring runs prior to installation.

3. Install conduit, cable, and wire parallel and square with building lines, including raised floors areas. Do not exceed forty percent fill in conduits. Gather wires and tie to create an orderly installation.

4. Coordinate with other trades to provide proper sequencing of installation.

3.3 FIELD COMMISSIONING AND CERTIFICATION

A. Field Commissioning: Test system as recommended by manufacturer, including the following:

1. Conduct complete inspection and testing of equipment, including verification of operation with connected equipment.

2. Test devices and demonstrate operational features for Owner's representative and authorities having jurisdiction as applicable.

3. Correct deficiencies until satisfactory results are obtained.

4. Submit written copies of test results.

3.4 TRAINING

A. Conduct on-site system training, with the number of sessions and length of sessions as recommended by the manufacturer. Training shall include administration, provisioning, configuration, operation and diagnostics.

END OF SECTION.

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